



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 460

Interpretation Concerning Involvement of NASA Astronauts During a Licensed Launch or Reentry

AGENCY: Federal Aviation Administration, DOT.

ACTION: Interpretation.

SUMMARY: This interpretation responds to a request from the National Aeronautics and Space Administration (NASA) regarding whether the space transportation regulations of the Federal Aviation Administration (FAA) would restrict NASA astronauts from performing operational functions during a commercial space launch or reentry under license from the FAA.

DATES: Effective [Insert Date of Publication in the Federal Register].

FOR FURTHER INFORMATION CONTACT: For technical questions, contact Pam Underwood, Deputy Manager, Operations Integration Division; pam.underwood@faa.gov. For legal questions, contact Alex Zektser, Office of the Chief Counsel, International Law, Legislation, and Regulations Division, Federal Aviation Administration; e-mail alex.zektser@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

On July 3, 2013, NASA asked the FAA whether the FAA would restrict NASA astronauts, who are U.S. Government employees, from engaging in operational functions

during an FAA-licensed launch or reentry. NASA noted that all NASA astronauts undergo extensive training and must meet rigorous medical and training requirements. NASA will also ensure astronauts complete training specific to each launch and reentry operator's vehicle and operations.

Specifically, NASA asked whether, under the FAA's statute and regulations, a NASA astronaut flying as a space flight participant could engage in "all nominal and off-nominal operational functions," including "the conduct of aborts, emergency response, and monitoring and operating environmental controls and life support systems." NASA also asked the FAA whether NASA's astronauts could "perform operational activities up to and including flight." In response to NASA's question, the FAA examined the launch and reentry scenarios currently envisioned, and concludes that NASA astronauts may perform these functions in FAA-licensed launches and reentries.

Scenarios

The FAA understands that the following scenarios are likely, but not definite. It is the FAA's understanding that a NASA astronaut's interaction with the controls of a launch or reentry vehicle may vary depending on a launch or reentry operator's designs and operational procedures, which are currently under development. During a nominal launch, a launch operator under an FAA license would most likely conduct the ascent using a flight computer as the primary means of controlling the flight path of the vehicle. Any persons on board would not likely affect the flight path of the launch vehicle. If an emergency situation arose, a NASA astronaut could override the launch operator's flight computer to initiate an abort from the launch vehicle and take manual control of the spacecraft atop the launch vehicle. NASA astronaut emergency operations could include

manually initiating an abort, using thrusters to orient a capsule to support chute deployment, and subsequent deployment of any parachutes. Emergency operations could also include the NASA astronaut manually piloting a vehicle to a water or runway landing.

For a reentry, a licensed operator's flight computer could serve as the primary means of controlling the flight path of the vehicle during a nominal reentry. A NASA astronaut might manually initiate the reentry burn, and the flight computer could conduct the reentry of the vehicle during nominal operations. The NASA astronaut could also have the capability to take manual control over the reentry vehicle in an off-nominal or emergency situation. During an off-nominal or emergency situation, the NASA astronaut would, much of the time, be using procedures or training prepared by the reentry operator.

Discussion

A. Space Flight Participants who are NASA Astronauts

Based on the above scenarios, we conclude that, under 51 U.S.C. ch. 509 (Chapter 509), the FAA's space regulations at 14 CFR ch. III, and consistent with the FAA's discussion of its human space flight requirements,¹ a NASA astronaut may engage in operational functions, up to and including piloting the vehicle, the conduct of aborts, emergency response, and monitoring and operating environmental controls and life support systems, and the launch or reentry would remain under FAA jurisdiction.

Chapter 509 addresses crew and space flight participants, and, according to Chapter 509's definition, NASA astronauts are space flight participants. Chapter 509 defines

¹ Human Space Flight Requirements for Crew and Space Flight Participants, Final Rule, 71 FR 75616 (Dec. 15, 2006) ("Human Space Flight Rule").

“crew” as “any employee of a licensee or transferee, or of a contractor or subcontractor of a licensee or transferee, who performs activities in the course of that employment directly relating to the launch, reentry, or other operation of or in a launch vehicle or reentry vehicle that carries human beings.” 51 U.S.C. § 50902(2). Conversely, a “space flight participant” is “an individual, who is not crew, carried within a launch vehicle or reentry vehicle.” *Id.* § 50902(17). Because a NASA astronaut is not an employee of a licensee or transferee, or of a contractor or subcontractor of a licensee or transferee, a NASA astronaut is not crew. Consequently, a NASA astronaut who is being carried within a launch or reentry vehicle is a space flight participant.

B. Limitations

Chapter 509 does not specify any limitations on a space flight participant’s conduct or operations during a launch or reentry. Similarly, FAA regulations implementing Chapter 509 for space flight participants, codified at 14 CFR part 460, also do not specify any limitations on a space flight participant’s conduct or operations during a launch or reentry. See 14 CFR 460.41, et. seq.² The only place where the FAA limits space-flight-participant conduct or operations is in the preamble to the Human Space Flight rule that created part 460. There the FAA states that:

For public safety reasons, the FAA will not allow space flight participants to pilot launch or reentry vehicles at this time. A space flight participant who wants to pilot a launch or reentry vehicle would have to become an employee or independent contractor of the operator to acquire vehicle and mission-specific training. The operator will be in a better position to evaluate the skills of an employee or independent contractor than of a space flight participant, particularly as those skills relate to the requirements of the operator's particular vehicle. The FAA acknowledges that this restriction may create a dilemma for someone who wishes to acquire training in order to become employed, but, while the technology

² The pertinent FAA regulations simply require that space flight participants: (1) be informed of risk; (2) execute a waiver of claims against the U.S. Government; (3) receive training on how to respond to emergency situations; and (4) not carry any weapons onboard. See 14 CFR §§ 460.45 – 460.53.

is so new, it is important for public safety that pilots be highly skilled at the outset.³

As can be seen, the FAA's concern with space flight participants interacting with a launch or reentry vehicle was based on the possibility that space flight participants would not have the proper vehicle and mission-specific training. However, as NASA notes, NASA astronauts must meet rigorous medical and training requirements, which include training specific to each mission, launch vehicle, and reentry vehicle. Because NASA astronauts are not the untrained space-flight participants originally contemplated by the FAA, the considerations underlying the policy have, at best, a limited applicability to NASA astronauts. Thus, for the scenarios currently envisioned, NASA astronauts may engage in operational activities during a licensed launch or reentry to ensure safety and mission success

C. Jurisdiction

We note that Chapter 509 does not apply to launches or reentries the U.S. Government carries out for itself. 51 U.S.C. § 50919(g). Accordingly, NASA is not carrying out the launches or reentries that are subject to Chapter 509. In the event, not contemplated in this interpretation, that a NASA astronaut exercised sufficient operational control to carry out the launch or reentry, § 50919(g) would serve as a bar to FAA licensing the activity.

In the scenarios described above, as currently under development by launch and reentry operators, the NASA astronaut would likely not affect the flight path of the vehicle during a nominal launch. During a launch, the astronaut would likely only manipulate the flight path of the vehicle if an emergency arose. Accordingly, section

³ Human Space Flight Requirements Final Rule, 71 FR at 75618.

50919(g) would not limit a NASA astronaut's ability to engage in operational functions during launch. Most of the conduct or operations would simply constitute the execution of emergency training required of space flight participants by § 460.51.

The analysis for a reentry is similar to that of a launch, with some additional consideration for the possible manual operation of the reentry vehicle by a NASA astronaut. Specifically, a NASA astronaut could initiate reentry manually, but because the scenarios have the reentry operator's flight computer directing the reentry, the NASA astronaut's interaction would not be sufficient to constitute NASA carrying out the reentry. Additionally, the NASA astronaut's exercise of manual control over the vehicle in an off-nominal situation would also not rise to NASA carrying out the reentry because, as discussed above, in an off-nominal situation, the astronaut would largely be implementing procedures created by a commercial launch or reentry operator for purposes of safety or mission success.

In conclusion, Chapter 509 and the FAA's regulations impose no operational constraints on NASA astronauts for the scenarios envisioned here.

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